JOB NO.	DWG NO.
1194	E-06-901

REFERENCE DRAWINGS	DWG NO.
LEGEND AND GENERAL NOTES	E-06-001
PANEL SCHEDULES (SHEET 1 OF 2)	E-06-902
PANEL SCHEDULES (SHEET 2 OF 2)	E-06-903

LEGEND:

SYMBOLS	DESCRIPTION
27	UNDER VOLTAGE PROTECTION
47	PHASE SEQUENCE PROTECTION
50	INSTANTANEOUS OVER CURRENT PROTECTION
50N	TIME OVER CURRENT PROTECTION
51	EARTH FAULT PROTECTION
51G	RESTRICTED EARTH FAULT RELAY
59	OVER VOLTAGE PROTECTION
63	TEMPRATURE TRIP RELAY (BUILT INTO TRANSFORMER) WIRED TO IPI
64	THREE PHASE LOAD BALANCE RELAY
PF	POWER FACTR METER
HZ	FREQUENCY METER
A	AMMETER
V	VOLTMETER
	POTENTIAL TRANSFORMER
	CURRENT TRANSFORMER
	TRANSFORMER 11/0.433KV DYN 11 (RATING AS ON DRAWINGS)
MDB	MAIN DISTRIBUTION BOARD
SMSB	SUB MAIN SWITCH BOARD
	FINAL DISTRIBUTION BOARD
	MOTOR CONTROL CENTER IP54 OR AS SPECIFIED
ACB	4 POLE WITHDRAWAL TYPE AIR CIRCUIT BREAKER (MOTORIZED TYPE) WITH SHUNT TRIP.
MCCB	3 POLE WITHDRAWAL TYPE MOLDED CASE CIRCUIT BREAKER
MCCB	3 POLE FIXED TYPE MOLDED CASE CIRCUIT BREAKER

PANELS NUMEROLOGY INDEX:

EDB.GL.PA.I
- SERIAL NO.
- AH: APPLICATION HALL, LB: LABORATORY, WH: WAREHOUSE, CA: COMMON AREA, IA: INNOVATION AREA, PA: PIPE ACADEMY
- L: LIGHTING, P: POWER, U: UPS, Q: EQUIPMENT
- FLOOR LEVEL G: GROUND, F: FIRST, S: SECOND, R: ROOF
- MDB : MAIN DISTRIBUTION BOARD, SMSB : SUB MAIN SWITCH BOARD, DB : DISTRIBUTION BOARD
- E : EMERGENCY

CABLE KEY:

YCZmm2
- SIZE OF MULTI CORE CABLE.
- NO. OF CABLE CORES.

IPI INTELLIGENT PROTECTIONS & INSTRUMENTATION PANEL

ECC EARTH CONTINUITY CONDUCTOR (SHALL BE CU-PVC TYPE)

HV INCOMER (ADDC)

BY OTHERS

DRY TYPE TRANSFORMER (INSIDE SERVICE BUILDING) 1000 kVA 11/0.433 KV DYN11

(F-MDB.PA.1) 50Hz 415V 6//1C630mm2 CU,XLPE/AWA/PVC +1//1C630mm2 ECC 10M, CABLE TRAY

TO HT-SWGR (MONITOR/TRIP)

MDB.PA.1 (AT SERVICE BUILDING)

51G 64 2000/1 CT

PF HZ V A VT

KWH KW 2000/5 CT

50N 50 27

59 51 47

IPI

TO "BMS" (ALARM/MONITOR)

TRIP M ACB 2000A

BUSBAR 2000A, 415V, 50HZ, TPN+E Isc=50KA

(F-PF.PA.1) 50Hz 415V 2//4C240mm2 CU,XLPE/SWA/PVC +1C240mm2 ECC 10M, CABLE TRENSH

MCCB 1000A 1000A

N E

PFI POWER FACTOR CORREC. CAP. BANK WITH HARMONIC FILTER 350KVAR (2x100+3x50)KVAR

(F-SMDB.G.PA.1) 50Hz 415V 3//4C240mm2 CU,XLPE/SWA/PVC +2//1C240mm2 ECC 10M, CABLE TRENSH

(F-MCC.PA.1) 50Hz 415V 2//4C185mm2 CU,XLPE/SWA/PVC +1C185mm2 ECC 110M, CABLE TRENSH

(F-ATS.PA.1) 50Hz 415V 2//4C95mm2 CU,XLPE/SWA/PVC +1C95mm2 ECC 5M, CABLE TRAY

MCCB	1000A 1000A	MCCB	1000A 1000A	MCCB	630A 1000A	MCCB 630A 100A	MCCB 100A 160A	MCCB 200A	MCCB 400A 400A

DESIGNATION	SMDB.G.PA.1	MCC.PA.1	SPARE	SPARE	SPACE	ATS.PA.1
LOCATION	LV ROOM SERVICE BUILDING	FIRST FLOOR	---	---	---	LV ROOM SERVICE BUILDING
CONN. LD. "KW"	405	260	---	---	---	130
TOTAL CONN. LD.	796 KW					
TOTAL DIV. LD.	688 KW (60% FOR EQUIPMENT ,80% FOR LIGHTING & SMALL POWER, 100% FOR HVAC DIV. FAC.)					

250KVA G G.PA.1 (INSIDE SERVICE BUILDING)

MCCB 400A

(F-ATS.PA.1) 50Hz 415V 2//4C95mm2 CU,XLPE/SWA/PVC +1C95mm2 ECC 5M, CABLE TRAY

(F-ATS.PA.2) 50Hz 415V 4C50mm2 CU,XLPE/SWA/PVC +1C25mm2 ECC 5M, CABLE TRAY

4-POLE ATS.PA.1 400A

4-POLE ATS.PA.2 250A

(F-EMDB.PA.1) 50Hz 415V 2//4C95mm2 CU,XLPE/SWA/PVC +1C95mm2 ECC 10M, CABLE TRAY

(F-MCC.PA.3) 50Hz 415V 4C50mm2 CU,XLPE/SWA/PVC +1C25mm2 ECC 10M, CABLE TRAY

FIRE PUMPS SET CONTROLLER MCC.PA.3

100 KW

SMDB.G.PA.1 (AT GROUND FLOOR LEVEL)

MCCB 1000A 1000A

BUSBAR 1000A, 415V, 50HZ, TPN-E Isc=35KA

MCCB	40A 100A	MCCB	160A 160A	MCCB	40A 100A	MCCB	40A 100A	MCCB	40A 100A	MCCB	80A 100A	MCCB	63A 100A	MCCB	40A 100A
MCCB	63A 100A	MCCB	80A 100A	MCCB	200A 250A	MCCB	80A 100A	MCCB	100A 100A	MCCB	40A 100A	MCCB	100A

(F-DB.GL.PA.1) 50HZ 415V 4C16mm2 CU,XLPE/SWA/PVC +1C16mm2 ECC 10M, CABLE TRAY

(F-DB.GP.PA.1) 50HZ 415V 4C70mm2 CU,XLPE/SWA/PVC +1C35mm2 ECC 10M, CABLE TRAY

(F-DB.GQ.PA.1) 50HZ 415V 4C25mm2 CU,XLPE/SWA/PVC +1C16mm2 ECC 40M, CABLE TRAY

(F-DB.GQ.PA.2) 50HZ 415V 4C25mm2 CU,XLPE/SWA/PVC +1C16mm2 ECC 50M, CABLE TRAY

(F-DB.GQ.PA.3) 50HZ 415V 4C35mm2 CU,XLPE/SWA/PVC +1C16mm2 ECC 65M, CABLE TRAY

(F-DB.GQ.PA.4) 50HZ 415V 4C70mm2 CU,XLPE/SWA/PVC +1C35mm2 ECC 60M, CABLE TRAY

(F-DB.GQ.PA.5) 50HZ 415V 4C70mm2 CU,XLPE/SWA/PVC +1C35mm2 ECC 70M, CABLE TRAY

(F-DB.FL.PA.1) 50HZ 415V 4C25mm2 CU,XLPE/SWA/PVC +1C16mm2 ECC 40M, CABLE TRAY

(F-DB.FP.PA.1) 50HZ 415V 4C35mm2 CU,XLPE/SWA/PVC +1C16mm2 ECC 40M, CABLE TRAY

(F-DB.GL.PA.2) 50HZ 415V 4C35mm2 CU,XLPE/SWA/PVC +1C16mm2 ECC 40M, CABLE TRAY

(F-DB.GP.PA.2) 50HZ 415V 4C120mm2 CU,XLPE/SWA/PVC +1C70mm2 ECC 40M, CABLE TRAY

(F-DB.GP.PA.6) 50HZ 415V 4C25mm2 CU,XLPE/SWA/PVC +1C16mm2 ECC 40M, CABLE TRAY

DESIGNATION	DB.GL.PA.1	DB.GP.PA.1	DB.GQ.PA.1	DB.GQ.PA.2	DB.GQ.PA.3	DB.GQ.PA.4	DB.GQ.PA.5	DB.FL.PA.1	DB.FP.PA.1	DB.GL.PA.2	DB.GP.PA.2	DB.GP.PA.6	SPARE	SPARE	SPACE
LOCATION	ELEC. ROOM GROUND FLOOR	ELEC. ROOM GROUND FLOOR	MECHANICAL TESTING LAB	ANALYTICAL AND PHISICAL TESTING LAB	PRESSURE TESTING LAB	PRATICAL TRAINING ROOM 1	PRATICAL TRAINING ROOM 2	ELEC. ROOM FIRST FLOOR	ELEC. ROOM FIRST FLOOR	ELEC. ROOM GROUND FLOOR	ELEC. ROOM GROUND FLOOR	ELEC. ROOM GROUND FLOOR	---	---	---
CONN. LD. "KW"	18	62	19	18	15	35	35	19	25	31	89	39	---	---	---
TOTAL CONN. LD.	405 KW														

EMDB.PA.1 (AT SERVICE BUILDING)

MCCB 400A 400A

BUSBAR 400A, 415V, 50HZ, TPN-E Isc=35KA

MCCB	80A 100A	MCCB	80A 100A	MCCB	40A 100A	MCCB	40A 100A	MCCB	80A 100A
MCCB	63A 100A	MCCB	40A 100A	MCCB	40A 100A	MCCB	100A

UPS.PA-40 KVA 415/415,3PH,4W,50HZ 30 MIN

RECTIFIER (BUILT IN) BATTERY INVERTER STATIC SWITCH MANUAL BY PASS MAINTENANCE

(F-DB.GU.PA.1) 50HZ 415V 4C35mm2 CU,XLPE/SWA/PVC +1C16mm2 ECC 100M, CABLE TRENCH

(F-EDB.GL.PA.1) 50HZ 415V 4C16mm2 CU,XLPE/SWA/PVC +1C16mm2 ECC 100M, CABLE TRENCH

(F-EDB.GL.PA.2) 50HZ 415V 4C25mm2 CU,XLPE/SWA/PVC +1C16mm2 ECC 130M, CABLE TRENCH

(F-DB.SB.PA.1) 50HZ 415V 4C35mm2 CU,XLPE/SWA/PVC +1C16mm2 ECC 20M, CABLE TRENCH

(F-ELEV.PA.1) 50HZ 415V 4C35mm2 CU,XLPE/SWA/PVC +1C16mm2 ECC 60M, CABLE TRAY

(F-EDB.LS.PA.1) 50HZ 415V 4C35mm2 CU,XLPE/SWA/PVC +1C16mm2 ECC 20M, CABLE TRENSH

DESIGNATION	DB.GU.PA.1	EDB.GL.PA.1	EDB.GL.PA.2	EDB.SB.PA.1	ELEV.PA.1	EDB.LS.PA.1	SPARE	SPACE
LOCATION	ELEC. ROOM GROUND FLOOR	ELEC. ROOM GROUND FLOOR	ELEC. ROOM GROUND FLOOR	L.V. ROOM SERVICE BLDG.	ELEVATOR PIT	LV ROOM SERVICE BUILDING	---	---
CONN. LD. "KW"	26	12	15	35	20	23	---	---
TOTAL CONN. LD.	130 KW							

NOTES:-

1- THIS DRAWING SHALL BE READ IN CONJUNCTION WITH PROJECT SPECIFICATIONS

2- WIRES & CABLES INSIDE HAZARD AREAS SHALL BE LSF TYPE.

3- AS ADNOC SPECIFICATIONS :
- FOR MDB: ALL BREAKERS SHALL BE WITHDRAWABLE TYPE.
- FOR SMSB (FREE STANDING): ALL BREAKERS RATED 630A AND ABOVE SHALL BE WITHDRAWABLE TYPE.
- FOR SMSB (WALL MOUNTED): ALL BREAKERS SHALL BE MCCBS FIXED TYPE.

4- MICROPROCESSOR BASED MULTI-FUNCTION PROTECTION AND METERING RELAYS SHALL BE USED.

5- METERING MODULE SHALL BE USED. ONLY THOSE FUNCTIONS SHOWN ARE TO BE OPERATIONAL, REMAINING FUNCTIONS TO BE DISABLED.

6- ALL PROTECTION RELAYS SHALL BE OF THE WITHDRAWABLE TYPE.

7- THE CONTRACTOR SHALL VERIFY THE FINAL LOADS IN COORDINATION WITH OTHER TRADES. ACCORDINGLY FINAL SIZES OF CABLES AND CIRCUIT BREAKERS SHALL BE ADJUSTED WITHOUT ANY COST IMPLICATION TO THE COMPANY.

8- THE SHORT CIRCUIT RATING INDICATED ON DRAWINGS REPRESENT THE SERVICE SHORT CIRCUIT Isc WHICH ALL THE COMPONENTS OF PANEL BOARD SHALL WITHSTAND INCLUDING BUS BARS, CIRCUIT BREAKER, FIXING MATERIALS ... ECT. AS PER IEC 947-2 ALL CIRCUIT BREAKERS SHOULD BE SELECTED TO ASSURING FULL DISCRIMINATION OF LOAD FAULTS.

9- THE SIZE OF THE CAPACITOR BANKS INDICATED HERE IN IS INDICATIVE, THE CONTRACTOR SHALL SIZE THE CAPACITOR BANKS SUCH AS TO ACHIEVE A MINIMUM POWER FACTOR OF 0.95-1.0, HARMONIC FILTERS SHALL BE INSTALLED TO SOLVE HARMONIC DISTORTION WHICH CAUSED BY THE CAPACITORS.

10- TN-S EARTHING SYSTEM SHALL BE ADOPTED FOR THE WHOLE DISTRIBUTION SYSTEM. 5 WIRE SYSTEM SHALL START FROM MAIN LOW TENSION PANEL SUPPLIED FROM TRANSFORMER UP-TO FINAL LOAD POINTS.

11- AS ADNOC SPECIFICATIONS, INDEX OF PROTECTION FOR MDB & SMSB (FREE STANDING) SHALL BE IP44. FOR SMSB (WALL MOUNTED) SHALL BE IP 41 FOR INDOOR APPLICATION & IP 55 FOR OUTDOOR APPLICATION. FOR DISTRIBUTION BOARDS & PANEL BOARDS SHALL BE IP31 FOR INDOOR APPLICATION, IP55 FOR OUTDOOR & INDUSTRIAL AREAS UNLESSOTHERWISE INDICATED.

12- THE CONTRACTOR SHOULD CONFORM ALL THE WORKS WITH THE ADDC REGULATIONS WITHOUT ANY COST IMPLICATIONS.

13- THE MEASURING AND PROTECTION DEVICES ARE JUST FOR GUIDANCE ONLY, THE CONTRACTOR SHOULD FULFILL ALL THE REQUIREMENT OF THE ADDC REGULATIONS WITHOUT ANY COST IMPLICATION TO THE CONTRACT.

14- FOR EXACT POWER CONSUMPTION OF THE MECHANICAL/HVAC EQUIPMENT, REF. TO MECHANICAL/HVAC DIVISIONS DRAWINGS AND DOCUMENTS.

15- THE CONTRACTOR SHOULD PROVIDE ALL THE AUXILIARY CONTACTS / DEVICE REQUIRED TO COMMUNICATE WITH THE BUILDING MANAGEMENT SYSTEM (BMS) ACCORDING TO THE BMS SCHEDULES.

16- KWH METER SHALL BE ARRANGED IN A SUITABLE MANNER TO ADDC APPROVAL.

17- EARTH LEAKAGE SENSORS/RELAYS SHALL BE PROVIDED IN FEEDER EQUIPMENT/LOAD LIKE AHUS, PUMPS, FANS, HAND DRYERS ETC. AS PER ADDC REQUIRMENT.

18- THE CONTRACTOR SHALL SUBMIT THE FOLLOWING CALCULATIONS AND STUDIES FOR APPROVAL :
- LOAD SCHEDULES FOR ALL DISTRIBUTION BOARDS & LOAD FLOW
- CABLE SIZING AND VOLTAGE DROP CALCULATIONS
- SHORT CIRCUIT CALCULATIONS AT EACH BUS
- DISCRIMINATION STUDY & CIRCUIT BREAKERS SETTING VALUES OBTAINED FROM THE MANUFACTURER
- CABLE TRAY SIZING CALCULATIONS

19- ALL CIRCUIT BREAKER RATINGS SHOWN ON DRAWING ARE PRESENTING THE THERMAL TRIP SETTING AND FRAME SIZE. CIRCUIT BREAKERS RATED 100A AND ABOVE SHALL BE EQUIPPED WITH ADJUSTABLE TRIP SETTING.

CLIENT :

أدنوك ADNOC شركة بترول أبوظبي الوطنية

G.F	M.F	K.S	M.N	M.N	ISSUED FOR ADDENDUM NO.1	26/11/08	1
G.F	M.F	K.S	M.N	M.N	ISSUED FOR TENDER	19/10/08	0
PROJ APPROVED	TEAM	JOB ENG	CHK	BY	REVISIONS	DATE	REV NO.

PROJECT :

BOROUGE INNOVATION CENTER
IN ABU DHABI
AGREEMENT NO:II5984DI - PROJECT NO.5984

END USER :

بروج Borouge

CONSULTANT :

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PIPE ACADEMY BUILDING

SINGLE LINE DIAGRAM

SCALE	JOB NO.	DWG NO.	REV NO.
NTS	1194	E-06-901	1

FILENAME